3 KEY FEATURES AND CURRENT CONDITIONS

"Gloucester Harbor is an important resource for the Commonwealth of Massachusetts. The Harbor provided a major center for the fishing industry, maritime business, and future opportunities to expand marine-based uses. The Harbor has drastically changed since European colonization to support the working waterfront. Coastal development, dredging and filling, and increased human population altered the shape of the Harbor. The fishing industry remains an important component of Gloucester Harbor. The fisheries, including target species and fishing practices, changed through time, but the economy and society of Gloucester endured these changes…" (Massachusetts Office of Coastal Zone Management [CZM] 2004)

3-1 LAND USE: OVERVIEW

Land use around Gloucester Harbor includes a wide range of activities, as indicated in Figures 3-1 to 3-8: In general, the west side of the Harbor, stretching from "The Fort" to the Gloucester Maritime Heritage Center, is characterized by mixed industrial and commercial uses with several vacant or underutilized parcels. The area from Harbor Loop to the State Fish Pier has large-sized lots used almost exclusively for industrial activities. The eastern side of the Harbor, along East Main Street and around Smith Cove, and Rocky Neck, has very little (less than 5%) vacant or underutilized land and has a balanced mix of commercial, industrial, and residential properties. Most of the waterfront parcels within the Harbor's Designated Port Area (DPA) continues to be predominately used for marine industrial activities that directly or indirectly support the commercial fishing industry. However, with the current downturn in the fishing industry, several of these businesses are struggling to survive.

Harbor Cove has been the traditional heart of the commercial fishing industry in Gloucester and still provides essential dock space for fishing vessels and is the home for many important shore-based support services for this industry. There are several underutilized parcels around the Cove that have attracted the attention of commercial developers with projects that would not displace nor conflict with existing marine industrial activity. The most important of these is lot I4/C2 between the Building Center and the Gloucester House on Rogers Street. There is a general consensus that Commercial Street has become functionally obsolete as an area that can effectively supported most modern marine industries because of the relatively shallow water depths, small parcel sizes, and the difficulty with moving large trucks into and out of this area. Businesses along the north side of this street that currently serve the commercial fishing industry should be supported, but efforts to attract other marine industrial activities in this area should not be a priority.

The Industrial Port (Harbor Loop to the State Fish Pier) has become the City's primary marine industrial area with 98% of the land within this district predominantly under industrial or accessory-to-industrial uses. It has recently experienced several significant changes, including the opening of the Gloucester Seafood Display Auction, modernization of Americold's and Gorton's waterfront infrastructure, and significant expansion of facilities on the Jodrey State Fish Pier. Most recently, the development of the Gloucester Marine Terminal at Rowe Square offers important new opportunities for the Port. The district has excellent access to the nearby interstate highway system (Rte. 128/I95), deep-water access via the Port's main federal shipping channel, and large open outside work areas. The average lot size in the Industrial Port is over 2 acres compared to less than ¾ acre for Harbor Cove and less than ¼ acre in East Gloucester.

Figure 3-1. Existing Conditions - Harbor Cove 1

Figure 3-2. Existing Conditions - Harbor Cove 2

Figure 3-3. Existing Conditions - Industrial Port 1

Figure 3-4. Existing Conditions - Industrial Port 2

Figure 3-5. Existing Conditions - Industrial Port 3

Figure 3-6. Existing Conditions - East Gloucester 1

Figure 3-7. Existing Conditions - East Gloucester 2

Figure 3-8. Existing Conditions - East Gloucester 3

East Gloucester's DPA waterfront is a mixture of marine industrial and commercial operations. Interspersed among these are a number of recreational marinas and residential properties (most away from the water's edge), that, while not conforming with DPA regulations, existed before the DPA was established and are therefore "grandfathered." The ability for East Gloucester to support significant intense marine industrial uses is limited by the dimensions of, and uses along, East Main Street. Expansion or development of new marine industrial uses that would require frequent large truck access is not practical.

Much of **Smith Cove**, although within the Plan's study area, is outside the DPA. It has seen little change in recent years, and continues as primarily a residential and visitor district, home of America's oldest continuously active art colony. There are significant parking limitations within and narrow roadways leading into this area. An alternative to automobiles, such as an Inner Harbor water shuttle system, is needed to bring more visitors to this important Harbor business district.

The future economic vitality of Gloucester's working waterfront will clearly be affected by many issues including the local and regional economy; sustainable levels of fish stocks off Gloucester, demand for and availability of developable DPA properties, the condition of existing transportation and utility infrastructure; the availability of government subsidies/grants and affordable financing opportunities, and appropriateness of regulations affecting land use and construction. This Harbor Plan recommends a series of changes that will allow the Port of Gloucester to continue to support existing traditional marine industries while also positioning it to take advantage of important new opportunities expected to surface over the next several years and/or decades. Recommended actions include not only making improvements to core port infrastructure but also employing more effective use of state and local planning, regulations, and economic incentives to support appropriate development proposals and to attract new marine industries.

3-1-1 Economic Potential of the Waterfront

The working waterfront is an under-realized economic asset for the City. Although marine industrial activity in this working port is less than it has been at times in the past, the waterfront infrastructure and collection of maritime businesses existing along Gloucester Harbor represent a rare and valuable economic asset that should be more fully developed and supported to benefit both the City's and Region's economy. Commercial fishing and other marine industries are seen as distinguishing attributes of the Port, drawing visitors to the water's edge and non water-dependent economic interests to the City. These harbor planning efforts emphasize the importance of retaining existing jobs and economic activity as well as creating new opportunities for employment, business development, and additional sources of tax revenue.

Although the health of New England's commercial fishing industry has been adversely affected by reduced groundfish catch in recent years, marine scientists, regulators and many within the fishing industry are working to recover groundfish stocks to levels that will allow harvesting of the stocks' maximum sustainable yields. At these levels, landings are optimistically projected to be 300% of current groundfish landings. In 2004, major new federal restrictions went into place setting legally binding goals for rebuilding groundfish stocks by the year 2014. Other restrictions have been added since 2004 to ensure that the 2014 goals are met. The full degree to which the fish stocks will recover remains unknown, although, if the goals are met as mandated for 2014, Gloucester could be in a position to land at least three times the volume of groundfish currently brought into the Port - a volume comparable to that realized in the mid-1980s. This can only be achieved if Gloucester retains and/or rebuilds the needed infrastructure and services to support a commercial fishing fleet capable of harvesting this quantity of groundfish and if it can also attract the larger fishing vessels (70+ feet in length) required to efficiently

harvest the ground fish stocks located far off-shore (e.g. Georges Bank). Without adequate vessel berthing space; core services such as boat/gear repair, fueling and ice provisioning; and a display auction and/or other markets for their catch, Gloucester will not be in a position to benefit from healthy groundfish stocks.

The current efforts to rebuild the groundfish stocks are predicted to take a number of years. Meanwhile, there has been a shift in the marine industry in Gloucester with an increasing number of lobster boats and a number of businesses diversifying into non-traditional target species or non-fishing related marine industrial activities. Such diversification helps to protect waterfront property owners from some of the uncertainties associated with relying solely on the health of the groundfish industry.

A more complete discussion of the changes in Gloucester's commercial fishing industry and the services and facilities needed to support this industry is offered in two reports of a recent collaborative research project investigating the commercial fishing infrastructure that enable commercial fishing in Gloucester [2, 2]. These studies were part of a larger research project called the Community Panels Project funded by Northeast Consortium and the Saltonstall-Kennedy federal grant program and examined six New England fishing ports. The Gloucester segment of this initiative was conducted by anthropologist Sarah Robinson working with a panel of Gloucester fishing captains and shoreside businesses owners in Gloucester. The two research reports (both available online at www.gloucester.ma.us under "Harbor Plan") serve as companion documents to this Harbor Plan and support the position that Gloucester has served, and can continue to serve, as a one of the few remaining full-service regional hub ports for New England's commercial fishing industry. This research also determined that that status is precarious.

In addition to commercial fishing, the Port of Gloucester within its DPA has the capacity to support other marine industries and port activities including passenger transportation (excursion boats, international and domestic ferries, cruise ships), short sea shipping, additional boat building and repair facilities, and marine construction operations. New technologies within the seafood industry such as innovative vessel types and gear, aquaculture, protein recovery, and harvesting and processing non-traditional species may also offer new opportunities for the Port that should be encouraged/supported. This new and/or expanded mix of marine industries will offer diversity that should help reduce the major fluctuations in the Port's economic health that are inherent when there is a nearly total dependency on one industry such as commercial fishing.

3-1-4 Water-Dependent Uses

Water-dependent industries of varying sizes abound in the Harbor. The Industrial Port is dominated by both water-dependent and nonwater-dependent industry, with lesser concentrations of these activities in Harbor Cove and along the East Gloucester waterfront.

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[2] Robinson, Sarah, and the Gloucester Community Panel. 2003. "A Study of Gloucester Commercial Fishing Infrastructure: Interim Report." Community Panels Project, Massachusetts Fishermen's Partnership (M. Hall Arber, D. Bergeron, & B McCay, project investigators)

[2] Robinson, Sarah, and the Gloucester Community Panel. 2005. "Commercial Fishing Industry Needs On Gloucester Harbor, Now and In The Future" Community Panels Project, Massachusetts Fishermen's Partnership (M. Hall Arber, D. Bergeron, & B McCay, project investigators).

While Gorton's and Americold have been traditionally classified as water-dependent and continue to own a large part of the existing waterfront industrial infrastructure in the Harbor's DPA, these companies are no longer dependent on fish stocks landed in Gloucester or on local marine transportation to carry their products to market. Their fish supplies and products they produce or store now arrive and are shipped out by truck.

A particularly interesting and valuable collection of water-dependent industries exists in Harbor Cove, the oldest portion of the Harbor. Although these businesses tend to be relatively small, most directly support the commercial fishing fleet and utilize the few remaining historic finger piers, thus retain some of the traditional character of Gloucester Harbor.

On the East Gloucester waterfront, water-dependent and nonwater-dependent industries are more widely interspersed among various commercial and residential uses. Industrial sites on this side of the Harbor are under-utilized as resources that support commercial fishing or other marine industries, thus offering opportunities for investment and more contribution to the economic value of the Port. Within this section of the Harbor, there is a concentration of water-dependent commercial uses, including several facilities catering to recreational boating. Many of these facilities offer boat repair and winter storage, qualifying them as water-dependent industry. Several of these water-dependent facilities are in disrepair and not fully or optimally using the property.

The continuing strength of the waterfront is evidenced by the overall use patterns of the Harbor with only a few, though significant, parcels standing vacant. Most of these are in Harbor Cove, most notably I4C2. Although not vacant, some areas are clearly underutilized, particularly along the East Gloucester waterfront, although most parcels are home to functioning businesses that should be positioned to capitalize on improvements in the local economy.

3-1-2 Regulatory Jurisdictions

There are a number of key jurisdictions and regulations which affect land use around the Harbor as is illustrated in Figure 3-9. They include:

Designated Port Area (DPA) is the area of developed waterfront designated by the State under 301 CMR 25.00 in which policies and regulatory authorities are directed toward preserving water-dependent maritime industry and supporting uses. The DPA program is administered by the Massachusetts Office of Coastal Zone Management (CZM).

Municipal Zoning controls use, density and dimensions of site development within the City. The area subject to this Municipal Harbor Plan falls within several zoning districts. The majority of land adjacent to the Harbor falls within the Marine Industrial zone, designed to promote marine industrial use and requiring that the water's edge be reserved for vessel access.

Historic High Water Line (HHWL) is the inland limit of the state's jurisdiction under Chapter 91, the Public Waterfront Act, administered by the Department of Environmental Protection (DEP). The HHWL depicted on Figure 3-9 is an approximation based on available historic maps. The actual limit of Chapter 91 jurisdiction may be more landward or seaward, and is determined by the DEP on a case-by-case basis, but the HHWL used for this 2006 Plan is based on survey and research recently completed under a CZM contract and is the best available general estimate of the line.

Board of State Harbor Commissioner's Line (also refer to as the Harbor Line), is a line proposed by the City and approved by the State legislature and defines the seaward limit beyond which no structures can be built.

Note: The U.S. Army Corps of Engineers' jurisdiction in the Harbor for Section 10 (Rivers and Harbors Act) is up to the mean high water line and for Section 404 (Clean Water Act) is up to the spring high (i.e. highest astronomical) tide line including wetlands.

These and other regulatory programs are discussed in greater detail in Section 3-4.

3-1-3 Regulatory Standards for Water-Dependency

A critical measure of the status of the Harbor is the degree to which it has maintained its water-dependent uses and, particularly in the DPA, water-dependent industrial uses. Such uses are encouraged or required by Chapter 91 and by the City's Marine Industrial zoning. Chapter 91 broadly defines a water-dependent use as one that requires direct access to or location in tidal waters and cannot be located away from tidal waters [310 CMR 9.12 (2)]. The regulations include a list of uses which are categorically considered water dependent including:

- Water-dependent industrial uses such as
  - marine terminals
  - commercial passenger vessel operations
  - manufacturing facilities which rely on water borne transport of goods
  - commercial fishing and fish processing
  - boatyards and facilities for vessels engaged in port activities;
- marinas, commercial or recreational boating facilities;
- facilities for water-based recreation;
- pedestrian access facilities open to the general public;
- aquariums and other educational facilities dedicated primarily to marine purposes;
- waterborne transportation facilities;
- wildlife refuges;
- disposal sites sponsored or required by public agency for contaminated dredge sediment.

Within the DPA there are greater restrictions. Allowable uses are water-dependent industrial (see the first bullet above), general industrial and Supporting Commercial Uses. A number of uses are specifically prohibited within a DPA including residential, hotel/motel facilities, and recreational boating marinas. Commercial uses can be classified as "Supporting" when they provide direct economic or operational support for a water dependent industrial use in the DPA. The amount of Supporting Commercial Use below the Historic High Water Line cannot exceed a maximum area equivalent to 25 percent of the area of filled tidelands and pile-supported structures. While, theoretically, 25 percent Supporting Commercial Use **may** be permitted, such uses must also conform to other DPA and Chapter 91 restrictions as well as municipal zoning restrictions and setbacks. Commercial uses that may be approvable as supporting uses in the Gloucester DPA are identified in Chapter 5 of this Plan. A Designated Port Area Master Plan can amend the standard limitations on the amount of general industrial use that may be licensed as a supporting industrial use.

Other non-industrial uses may be permitted as "Accessory" uses. These include uses that are commonly associated with a water-dependent industrial use, such as parking for fish processing employees, on-site food outlets for employees, administrative offices supporting that use, or perhaps a small fresh fish retail business associated with a processing facility. An accessory use must be of a scale that is appropriate to the size of the facility with which it is associated.

Figure 3-9. Regulatory Jurisdictions

3-1-5 Existing Uses in the DPA

To understand the existing status of Gloucester Harbor relative to DPA standards, a parcel by parcel analysis was undertaken to determine the current amount of use on the Harbor in each of several categories of land use based on DPA classifications (Table 3-1). The analysis was based on site visits and interviews.

Table 3.1: Current Land Use in the Entire DPA. The land use category is based on the predominant use within each parcel and does not include public roadways but does include pile-supported wharves and buildings over water.

Category of Use	Acres	% of DPA
Water Dependent Industrial	38.4	45.2
Non-Water Dependent Industrial	22.2	26.2
Water Dependent Commercial	4.1	4.8
Non-Water Dependent Commercial	6.5	7.6
Under Utilized/Vacant	5.7	6.7
Other	8.1	9.5
TOTAL	**85.0**	**100.0**

This table confirms that a majority of the DPA, over 70 percent, is in industrial use with over 60% of that dedicated to water-dependent industries. Commercial activities occupy slightly more than 12 percent of the total DPA area, a percentage well below the limit of 25 percent allowed by the state, indicating that under the DPA regulations and an approved Harbor Plan, there is room for additional commercial growth adjacent to the waterfront if desired by the community.

Most of the commercial activity within the DPA is nonwater-dependent which, in general, tends to be retail and office space and includes the Building Supply Center on Harbor Loop, Doyans Appliances on Rogers Street, and a number of restaurants. Several stores are located on East Main Street within the DPA.

There are clear differences (see Table 3-2 and Figure 3-10) in land use in the three sub-areas of the DPA (i.e. Harbor Cove, the Industrial Port and East Gloucester).

Table 3.2: The Land Use for the Three Sub-District of the DPA as a Percentage of Area of Each District. The land use category is based on the predominant use within each parcel.

Category of Use	Harbor Cove		Industrial Port		East Gloucester	
	Acres	%	Acres	%	Acres	%
Water Dependent Industrial	8.3	42.5	24.1	51.0	5.9	32.8
Non-Water Dependent Industrial	0	0	22.3	47.0	0	0
Water Dependent Commercial	0	0	0	0	4.1	22.4
Non-Water Dependent Commercial	4.6	23.5	0.3	0.7	1.6	8.7
Under Utilized/Vacant	4.9	25.2	0	0	0.8	4.4
Other	1.8	8.9	0.6	1.3	5.7	31.8
Total	**19.6**		**47.3**		**18.1**	

An objective of this Harbor Plan is to ensure that marine industrial uses are maintained as the primary activity of the Harbor while also determining the extent to which supporting commercial activity can grow under the current regulatory restrictions and without displacing or conflicting with existing or new industrial uses. The data presented above indicate that there is ample opportunity to allow, or even encourage, additional carefully planned and controlled commercial uses and still comfortably remain within the boundaries applicable to DPA properties.

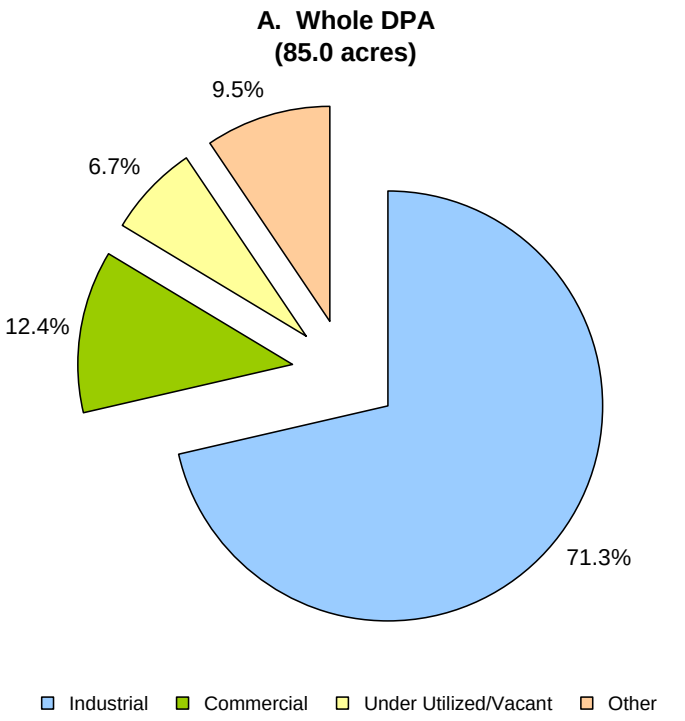
What is also very apparent from even a casual look at the data is that the three sub-districts within the DPA have very different land use patterns, in addition to the physical differences discussed earlier in this Plan. When the predominant use of the land area of each parcel is ascertained on a district by district basis, the following general conclusions can be drawn:

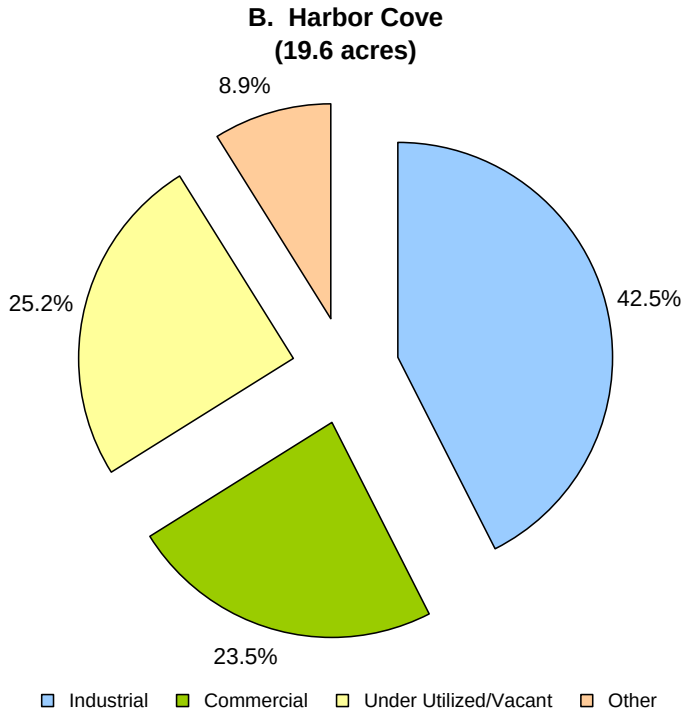
- The Industrial Port district (defined as MI-2 later in this Plan and including the Gloucester Marine Railway at Rocky Neck and the East Gloucester Americold facility) is over 98% dedicated to industrial use.
- Harbor Cove (later defined as MI-1) has a strong water-dependent industrial component (mostly serving the local fishermen) but the district also has slightly over 25% of the land area either vacant or underutilized and a relatively high percentage (pushing 25%) of non-water dependent commercial (e.g. restaurants, retail).
- East Gloucester (MI-3) has a balance (roughly a third each) of commercial, industrial and other (mostly residential and neighborhood business) uses. East Gloucester is the only district that currently has recreational marinas and residential units within the DPA, most grandfathered.

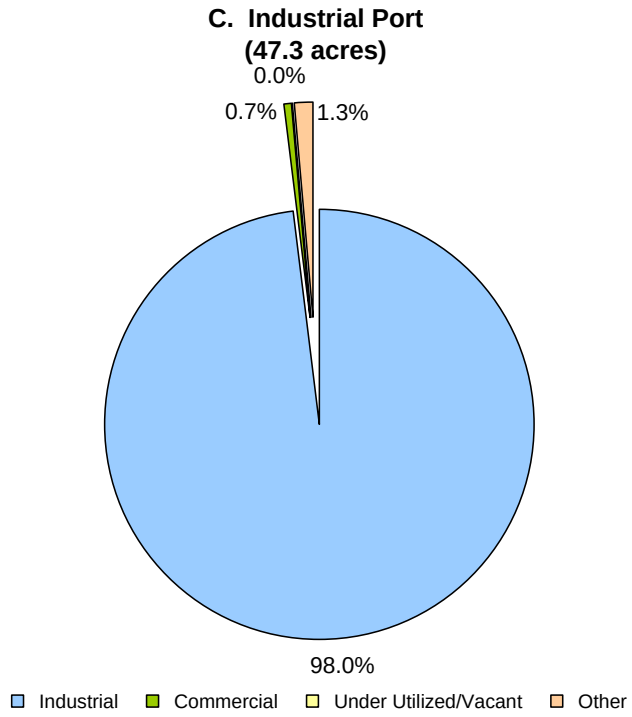
3-1-6 Development of the Waterfront

According to the *Gloucester Waterfront Study, Land Use and Economics*, in the years from 1980 to 1990, there was an increase in the number of parcels supporting marine industrial, commercial fishing-related businesses, marinas, and water-dependent commercial (excursion) uses on Gloucester Harbor. In that period, there were also shifts which reflect the reduced amount of fresh fish landed in Gloucester such as the increased ratio of wholesalers to processors, half of whom had converted to dealers. In general, however, there have been few major private investments in the Harbor in the past two decades. Following completion of the 1999 Gloucester Harbor Plan, a number of publicly funded infrastructure improvements were completed and others are either on-going or in the planning stage (see Table 2.1).

Since 1990, the pattern of use on the Harbor has not changed significantly: large dockside corporate firms mixed with smaller seafood buyers and processors, ice, fuel, and boat docks. However, beginning with the renovation of the State Fish Pier early in the 1990's, a number of individual investments and proposals have been made. Some of these were outlined in the 1999 Plan including a downtown hotel near the waterfront and a maritime museum/visitor center, but some of these did not move beyond the conceptual stage. In addition to the creation of the Gloucester Maritime Heritage Center and modernization of Groton's processing facility, one of the most significant new private developments that has been proposed and is expected to be completed by the end of 2006 is the Gloucester Marine Terminal at Rowe Square. This is designed to cater to proposed international and domestic ferry services and to visiting cruise ships. The terminal will have space for passenger ticketing and processing, food service, restrooms, retail and other support functions including U.S. Customs and INS operations. Both these businesses (ferries and cruise ships) are expected to add a new, healthy dimension to the industrial port while also benefiting retail in the City's central business district and its large inventory of visitor attractions.


A. Whole DPA
(85.0 acres)
9.5%
6.7%
12.4%
71.3%
Industrial
Commercial
Under Utilized/Vacant
Other


B. Harbor Cove
(19.6 acres)
8.9%
25.2%
42.5%
23.5%
Industrial
Commercial
Under Utilized/Vacant
Other



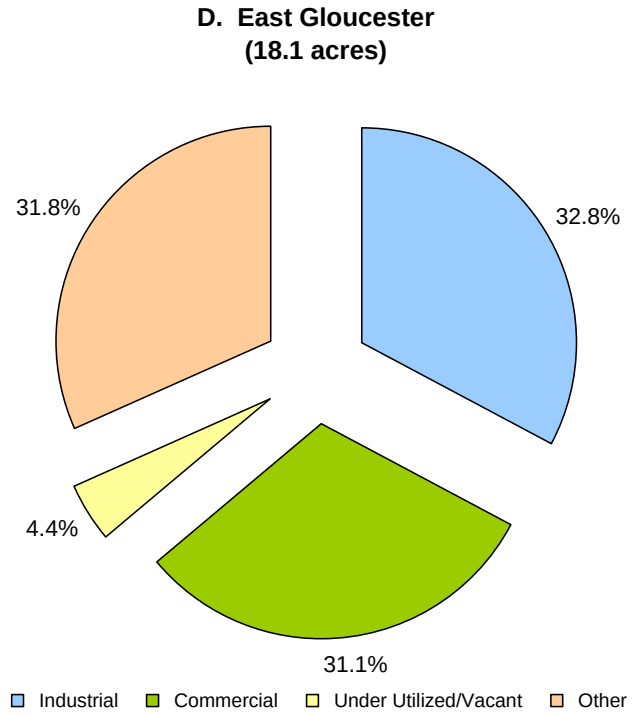


Figure 3-10 Current Land Use as a Percentage of the Whole DPA (A) Compared to the Land Use as a Percentage of Harbor Cove (B), the Industrial Port (C) and East Gloucester (D**). The land use category is based on the predominant use of land within each parcel.**

3-2 NAVIGATION AND WATER USE

Gloucester Harbor is used for a variety of purposes, including marine shipping, commercial fishing, recreational fishing and boating, excursion and tour boats, and a mix of other commercial, industrial and recreational uses. The operating depth of the main shipping channel at mean low water is slightly over 18.5 feet. This relatively shallow depth and small size of the Harbor combine to make it impractical for use by very large ships (generally not greater than 450 feet and with drafts of over 20 feet).

3-2-1 Harbor Access and Recreational Areas

Over the years, Gloucester has made many improvements to enhance the experience for the general public along the Harbor's shoreline. The Gloucester Tourism Commission developed a Gloucester Maritime Trail comprised of four distinct thematic pedestrian loops: (1) *Settler's Walk* through the Stage Fort Park area, (2) *Downtown Heritage Trail* through the downtown Gloucester Historic district, (3) *Vessel's View* through the State Fish Pier, and (4) *Painter's Path* through the Rocky Neck artist's colony (see Figure 3-11).

Public access to the shoreline is available throughout the Harbor, but is perhaps more limited in the Inner Harbor compared to other areas due to the industrial nature of much of the waterfront. Six public parks - Gemmellaro/Ciaramitaro Playground, St. Peter's Park, Gus Foote Park, Solomon Jacobs Park, Gordon Thomas Park, Ben Smith Playground - provide opportunity for active and passive recreation in the Inner Harbor. Stage Fort Park, located in the Western Harbor is home to *Gloucester's Visitor and Welcoming Center*. It was the site of the City's first settlement in 1623. Stage Fort Park offers parking, a beaches, picnic areas, playground, and excellent views of the Harbor. Stacy Boulevard, also in the Western Harbor, features a promenade overlooking Gloucester Harbor, the Gloucester Fishermen's Monument (*Man at the Wheel*), and the Fishermen's Wives Memorial Statue. Four public landings in the Inner Harbor allow boating access: Solomon Jacobs, Cripple Cove, Robinson's and Rocky Neck (see Figure 3-11).

Peak season tourist traffic can at times exceed the capacity of the available roadway and parking infrastructure around the Inner Harbor. East Main Street, which provides access to Rocky Neck and the artist's colony, is narrow, winding, and can be difficult to negotiate, particularly when truck traffic and visitor traffic combine.

3-2-2 Vessel Berthing and Moorings

Vessel berthing along open pile-supported wharves is available for large commercial vessels in the Industrial Port area at Gloucester Marine Terminal, the State Fish Pier, and Americold's wharves in East Gloucester, at Rowe Square and on Rogers Street. There is a total of approximately 2,600 linear feet of wharf area at these facilities ranging in individual lengths from 220 to 1000 feet and with dockside water depths generally between 18 and 23 feet at Mean Low Water (MLW). Some of this is currently used by large commercial boats harvesting pelagic fish and by merchant or passenger vessels making port calls but most is unused or underutilized. Berthing for smaller commercial boats (i.e. under 100 feet) is scattered throughout the Harbor (Figures 3-1 to 3-8) at a variety of public and private docks.

Figure 3-11. Public Access to Gloucester Harbor

Not including the open wharves mentioned above and based on a survey jointly completed by the Harbor Plan and Harbormaster offices in early 2006, there is currently dock space for about 260 commercial vessels and 280 recreational vessels in Gloucester's Inner Harbor of a size typical of those now using the Harbor (generally between 30' and 60'). There are another 50^{+} spaces that have in the past been used for rafting out (i.e. tying up outboard of a vessel berthed at a dock or wharf) by medium to large commercial fishing boats. The Inner Harbor has 126 mooring buoys used by commercial (24), recreational (86) and transient (16) boats. There are also approximately 20 vessel berths in the Harbor dedicated for use by commercial vessels receiving port services, including on-loading ice or fuel, off-loading fish at the Seafood Display Auction, or receiving/waiting for repair services. An additional 10 berths are used exclusively by government boats (Coast Guard, Harbormaster, and the Massachusetts Environmental Police).

Most of the Harbor's publicly owned docks and wharves used by the commercial fleet and the privately owned marinas used for recreational boats are in relatively good condition. Unfortunately, many of the Harbor's privately-owned docks and wharves used by commercial vessels are badly deteriorated and in need of dredging and major renovation or a complete rebuild. There are at least four areas in the Harbor (i.e. Americold East Gloucester, MassElectric, Building Supply Center, and old FBI properties) where commercial vessel berthing had been available in the past but the docks and/or wharves have been completely removed or are unusable. The 2006 survey estimated that another 50 or more berths could be created in these four areas (the number obviously dependent on the size of vessels for which the docks would be designed and used).

There are currently over 360 recreational boats (all either in East Gloucester or on moorings) that consider Gloucester's Inner Harbor their homeport. During the summer months, they fill all available marina slips and moorings authorized for recreational boats. Under current City and state regulations, no new recreational boat marinas may be built within Gloucester's DPA. Existing facilities have little room to expand and waiting lists for slips at these marinas and for private moorings in the Harbor are long.

There are about 250 commercial vessels homeported in Gloucester's DPA in 2006. The large majority of these are 30' to 60' fishing/lobster boats. Table 3-3 provides some rough estimates of how the size of the commercial ground fishing fleet has changed during the past two decades. These numbers were derived from several different sources ranging from National Marine Fisheries databases to personal observations by waterfront business owners, regulators and fishermen. Although the numbers from all sources do not match exactly, the trends observed are consistent. Over this period, both the number and average size of active commercial fishing vessels in Gloucester has declined and that decline has been most dramatic for the large, full range offshore groundfish boats.

Many of the large and medium ground-fish draggers and trawlers (55 – 100 feet) have moved to other ports, been scrapped or converted to other uses. This has had a significant negative impact on the economic health of the Port since these larger boats required more shore-based services and supplies than the smaller boats that remain. As discussed in Chapter 3, there are currently about 250 commercial fishing vessels home ported in Gloucester Harbor, including draggers, gill netters, lobster boats, and vessels harvesting a variety of other seafood such as shellfish, sea urchins, hagfish, tuna, and pelagics. Data collected by the NMFS Northeast Region office suggest a slightly higher number (268) of permitted fishing vessels in 2004/2005 and another 91 boats with older permits that list Gloucester as their "principal" port. From that database, it is difficult to determine which boats were actively fishing. There were also over 50 vessels from Gloucester with "tuna only" permits, although many or most of these are not commercially harvesting tuna. Some of these boats are docked or moored outside the Inner Harbor or, for smaller boats, are trailered to and from public landings such as Dunfudgin on the

Annisquam River. Some commercial fishermen from the region list Gloucester as their principal port although they may tie up their boats in neighboring smaller harbors such as Marblehead, MA or Hampton, NH and use Gloucester just for the services it can provide.

Table 3.3 Changing Size of Gloucester's Ground Fishing Fleet over the Past Two Decades. These figures are best estimates taking into account multiple sources of data. They illustrate the general trend in the numbers of vessels based in Gloucester at these times. Vessels under 55' are considered small near-shore day-trip boats, medium boats are those between 55' and 70', and large full-range Gloucester groundfish boats are generally over 70' but less than 100' long.

Period	# Vessels	Type
Mid 1980s	80	Large
	50	Medium
	70	Small
Mid 1990s	30	Large
	30	Medium
	60	Small
Mid 2000s	>10	Large
	20	Medium
	50	Smaller

The permit data also include information on the length of vessels (includes not only groundfish but all species) that held commercial fishing licenses in 2004/2005. An analysis of the data for those vessels is summarized in Figure 3-12 and shows that the majority (56%) of the boats were between 20 and 40 feet in length. Just under 26 percent were between 40 and 60 feet long and only 13 vessels were greater than 80 feet in length. This corresponds well with the information provided by local fishermen. Many of the largest boats remaining in Gloucester today are employed for harvesting pelagic species, hag fish and other non-ground fish.

Larger ground-fish draggers can stay at sea for longer periods thus can more efficiently harvest stocks from the traditionally more productive offshore fishing grounds such as George's Bank. Many of the current groundfish fleet rarely remain offshore overnight because of their small size. Thus, it is reason to expect that with the return of off-shore fish stocks, more large groundfish vessel will be needed.

Not including the 2600 linear feet of open wharves, Gloucester Harbor currently has dock and rafting out space available to accommodate additional 50 or more small to medium size (under 70') commercial boats, but most of these docks are in poor/unsafe condition or need to be dredged to accommodate boats of any appreciable size. In addition, as discussed above, 50 or more new berths could be created in four unused areas of the Harbor.

The 2003 and 2005 Community Panel reports (Robinson *et al.*) expressed the need for three general types of berths for commercial fishing vessels. These were (1) permanent berths for vessels homeported in Gloucester, (2) short-term berths for visiting vessels, and (3) transient berths for off loading catch and while using other port services. Some of the unused or newly created/renovated space discussed above may be needed to accommodate what hopefully will be a growing number of visiting commercial fishing boats using the many services offered in the Harbor. It is important to retain the ability to accommodate a mix of vessel sizes capable of harvesting different stocks of fish. The variety of services this diversity requires helps to keep the port service businesses and local fishing industry thriving.

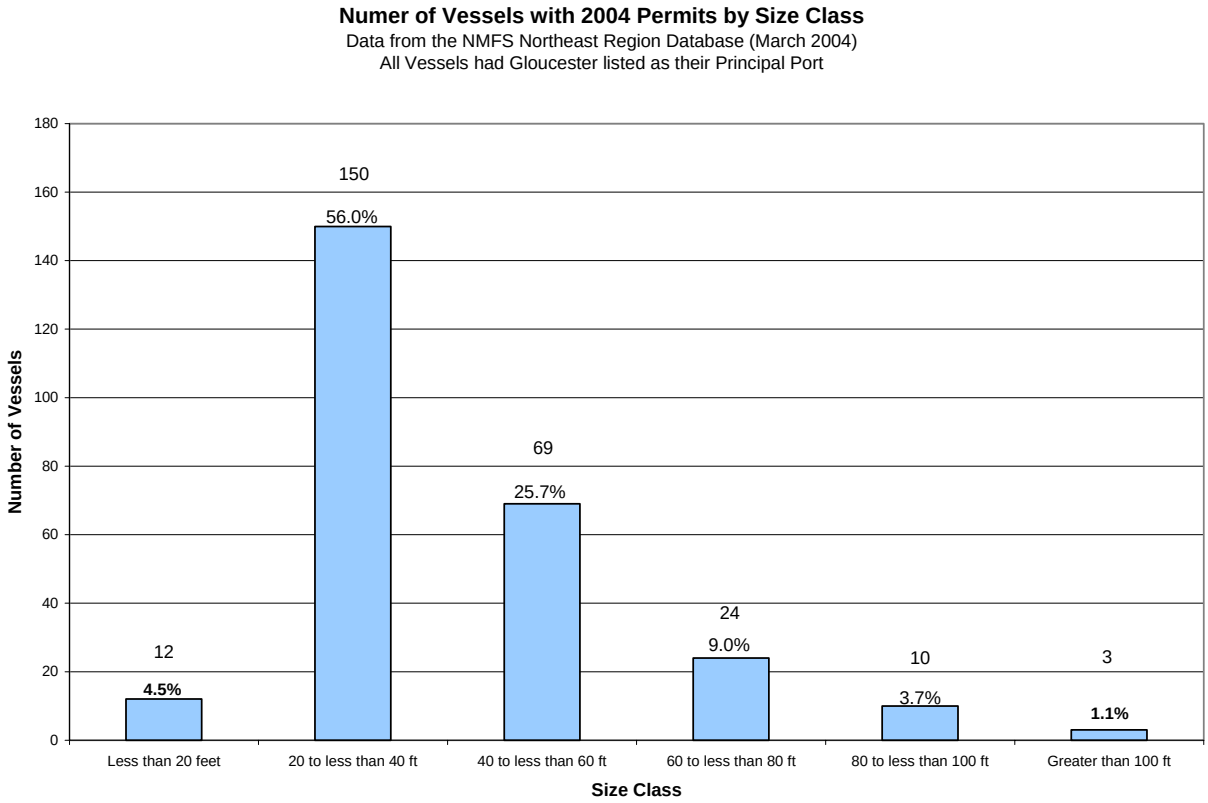


Figure 3-12 The Size Distribution of the 268 Fishing Boats in the NMFS Northeast Region Permit Database that Listed Gloucester as their Principal Port and had Commercial Permits for 2004/2005.

Although there currently appears to be sufficient commercial berthing spaces in the Port for the existing Gloucester fleet, demand for good quality dock space is high, as many docks in the Harbor continue to fall into disrepair. Affordable, safe and efficiently functional vessel berthing is a fundamental need of a productive working port. With reduced days at sea, more vessels remain tied up in port for longer periods of time and, in order to have more days at sea, some families own two or more permitted fishing boats (Hall-Arber 2003). Another change in the past two decades is that, with the loss of larger vessels, the average crew size is smaller. On large active boats, normally there is at least one crew member on board while the boat is in port. This makes it possible for more vessels to "raft out", since outboard boats can be moved to allow a boat tied up inside of them to get underway. With smaller crews, rafting out of several boats can often be more difficult to manage. Without this "stacking" of boats along the waterfront, fewer vessels consume greater linear feet of dock space.

A project to improve the public dock at Solomon Jacobs Park has been approved and construction work is expected to be completed during late 2006 or early 2007. Another pier renovation project is expected to begin in 2006 at the Gloucester Maritime Heritage Center. These will offer some additional dock space for commercial and recreational boats to drop off and pick up passengers and supplies and offer additional pedestrian access out over the water allowing residents and visitors a better opportunity to observe the working port.

3-2-3 Navigation and Dredging

Navigation channels in Gloucester Harbor are shown in Figure 3-9. Bathymetry is available on NOAA Chart No. 13281, 17th Edition, May 2000. The average tidal range is 8.7 feet, but

frequently exceeds 10 feet. The current controlling water depths at MLW in the main channels leading into different sections of the Harbor are 14 feet for Harbor Cove / Fort Point, 18.5 feet for all but the far northeast end of the North Channel, 17 feet for the South Channel, and 15 feet into Smith Cove and Rocky Neck. A 1995 study prepared by the Army Corps of Engineers (ACOE) found that maintenance dredging of the Federal Channel could not at that time be economically justified (ACOE 1995). Aside from the channel, approximately 250,000 cubic yards of dredged material needs to be removed from the Inner Harbor and the Annisquam River. Roughly 150,000 cubic yards of which are likely too contaminated to be disposed of offshore. Confined Aquatic Disposal (CAD) cells were identified as the most economical option for disposing of this material (MCZM 1998) but public opposition to this method has prevented this project from advancing. Dredging of the Annisquam River is expected to be completed in late 2006 or early 2007. With the expected return of the large-vessel fishing fleet, the highest priority for dredging will be along the docks in the Inner Harbor, areas that have become significantly silted in over the past several decades.

3-2-4 Commercial Fishing Industry

Founded in 1623 by fish companies from Dorchester and Gloucester, England, the City of Gloucester has a history, culture, physical structure, and economy inextricably linked to the fishing industry (Hall-Arber *et al*. 2001). Abundant stocks of key groundfish species such as cod, haddock and flounder flourished off the coast of Cape Ann, making Gloucester Harbor an ideal place not only to homeport a commercial fishing fleet, but also to add infrastructure needed to process and sell the catches.

As the fishing fleet grew, so did the support infrastructure, creating a Harbor dominated by fishing-related businesses. Even with recent declines in the fishing stocks and new regulations that closed certain areas to fishing and limited the number of days fishing vessels can spend at sea, Gloucester Harbor continues to survive as a one of a small handful of ports in the Northeast US capable of fully supporting a large fishing industry. With its cold storage/freezing facilities, bait, fuel and ice suppliers, fish brokers, marine supply shops, vessel repair facilities, the seafood display auction, Gloucester Harbor is currently in a position to serve as a major regional full-service hub port for a revitalized fishing fleet.

As regulations have limited fishing effort, the amount (both value and volume) of groundfish being landed in Gloucester has declined significantly from early 1980s, reaching a low in 1997. Groundfish landings have recovered very slightly since then with annual revenues averaging just under $20 million. Based on NMFS data for all species that they monitor including pelagics, lobsters and shellfish, there has been a significant increase in combined landings in Gloucester since 2000 (Figure 3-13). Most of this increase can be attributed to an increase in the harvesting of pelagic species (herring and mackerel) and the targeting of some less traditional species. Total combined revenues do not show a comparable large increase over the same period since these species have a much lower value per pound.

In Figure 3-13, for the past decade, the red **revenue** line primarily responded to the price and weight of lobster landed while the red **landing weight** line primarily reflects changes in the weight of pelagic (herring and mackerel) fish landed. The revenues realized in 1998 and 2004 were the exceptions when a large peak in pelagic landings did have a small but noticeably positive impact on total annual combined fish revenue for Gloucester. Herring generally brings 10¢ to 12¢ per pound while groundfish and lobsters have an off-boat value of over $1 and $4 per pound respectively for the past several years. The price of mackerel has been more variable (8 to 38¢ per pound) than other fish landed in Gloucester

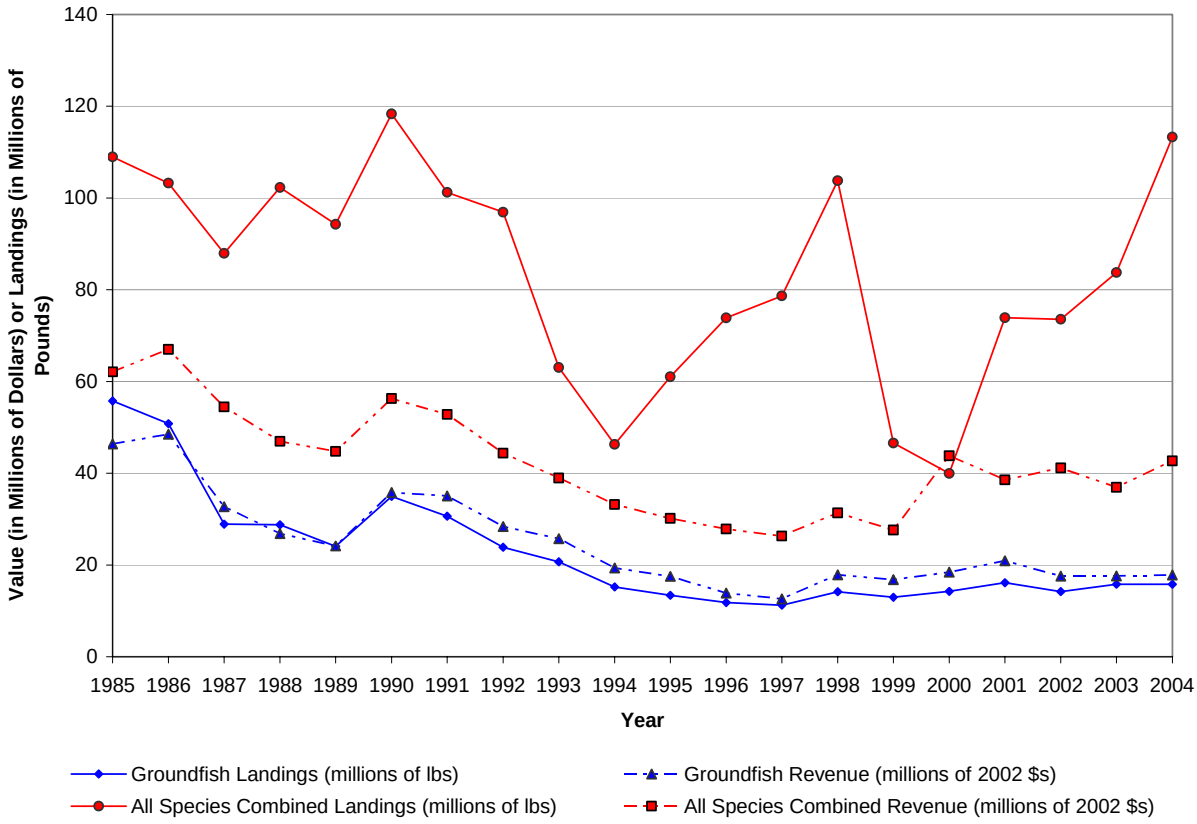


Figure 3-13 Gloucester Annual Landings and Revenues for Groundfish and for All Species Combined from 1985 to 2004. "Groundfish" refers to the twelve different species regulated under the NE Multispecies Management Plan (large mesh multispecies); including cod, flounder, haddock). "All species combined" refers to all species landed in Gloucester for which NMFS collected data. The chart is adapted from charts in the two Gloucester Community Panel Reports (Robinson et al, 2003 and 2005) which are based on data obtained from the National Marine Fisheries Service's Fishery Statistics website and analyzed by Robinson,

In 1994, herring and mackerel landings roughly equaled lobster landings by weight state-wide. By 1998, the total weight of herring and mackerel landed had increased by a factor of 5. A modest peak in lobster landings in 2000 more than offset the impact on combined revenue that resulting from a significant drop in pelagic landings that year. Until 2003, mackerel landings were less than 5% of herring by weight. In 2004, the weight of mackerel landed state-wide exceeded the weight of herring landed for the first time. Cape Seafood started landing pelagics in Gloucester in 2001 and much of the increase in combined landing weight depicted in Figure 3-12 since 2000 can be attributed to that operation. By 2004, herring and mackerel landings out weighed lobster landings state-wide by well over an order of magnitude. Gloucester experienced a similar growth. In the past few years, increased revenues from pelagics in Gloucester have been roughly offset by a drop-off in revenues from tuna, swordfish, and other non-groundfish.

Over the past decade, after the low in 1997, groundfish landings and revenues in Gloucester have remained comparatively low but relatively stable averaging about 18% of the total groundfish landed in New England. The revenues realized from groundfish landed as a percentage of the Port's total annual revenues from all species have been much more variable over the past decade ranging from just over 40% to slightly over 60%. In 1984, revenues from groundfish were 78% of the combined total.

In 1997, the Gloucester Display Auction opened, allowing buyers to bid on fish directly, rather than having to rely on a middleman to broker deals between the fishermen and the buyers The higher prices earned for higher quality fish sold at Auction helped support the Gloucester fishing community as regulatory pressures increased (Hall-Arber *et al.* 2001). The Auction also attracted boats from outside of Gloucester who then made use of the area's services and facilities, again supporting the area's economy. In 2000, the Auction was purchased by Global Food Exchange, who expanded the eligible buyers by allowing on-line bidding (Duchene 2000). The Auction now attracts fish buyers and processors not only from Gloucester but from Boston and other sites: in 2003 over 21 buyers and/or processors, most from out of town, were identified (Robinson et al, 2003).

Although there is general support for the Auction, its creation may have made it more difficult for some waterfront property owners to remain profitable. Prior to the Auction, these property owners had long-established arrangements allowing commercial fishing boats to berth along their waterfront for little or no charge in exchange for them selling their catches to the property owners who then served as fish brokers. Because they did not always get the best price for their fish, the old system may not have consistently favored fishermen. But some feel the new system adversely affects wharf owners who have relied heavily on the revenue generated from brokering fresh fish to supplement their properties' overall income. Some wharf owners complain that they cannot compete with the Auction and believe that it was unfair that the Auction's construction was partially subsidized with public funds. Further, they note that prices for vessel berthing at the State Fish Pier effectively set the market rate that private wharves can charge. Because of this, they can not rent dock space to commercial fishing vessels at prices that would give them adequate return on their investments to justify improvements or even maintenance of their waterfront docks and other pile-supported structures. For these reasons in combination with the continuing fishing industry recession, the Port of Gloucester may lose some critically important privately owned port infrastructure.

Fish processing includes all those activities needed to bring fish from the harvester to the consumer; namely, handling and sorting, de-boning and filleting, buttering/breading/stuffing and packaging, refrigerated storing or freezing, transporting, and/or brokering of fish. There are three processors of fresh groundfish operating in 2006 on Gloucester's waterfront: Ocean Crest, Pigeon Cove/Whole Foods, and Steve Connolly. Ocean Crest also produces a high quality fertilizer from fish waste under the name "Neptune's Harvest". In addition to these, there are eight or more very small businesses that rent space on the waterfront and buy and cut (and in one case smoke) groundfish landed in Gloucester.

The largest fish processors in Gloucester (Gorton's, North Atlantic Fish, Good Harbor Fillet) are not generally processing fish landed in Gloucester, but importing frozen fish that they use to produce their consumer products. Nearly all of the groundfish landed in Gloucester is destined for the higher value fresh fish market. At least two processors (Cape Seafood and Aram Fish) are exclusively handling pelagic species. At the time of this report, there were nine lobster buyers on the waterfront, a small handful of tuna buyers, a couple sea urchin buyers, one company focuses on shellfish, one buyer/processor of hagfish, monkfish and other species bound for markets in the Far East, and buyer/packer specializing in whole whiting for Spanish markets. Recent losses in the Port include shrimp and Jonah crab processors and Empire and Star fisheries.

Between the fishermen, processors, marketers, and other fishery-related employment opportunities, the fishing industry directly and indirectly impacted an estimated 2,000 Gloucester households in the late 1990s (Hall-Arber *et al.* 2001). Beyond employment and industrial impacts of the fishing industry, cultural, religious, and familial attributes of Gloucester have also been traced back to the City's reliance on and history steeped in fishing.

3-2-5 Commercial Lobster Industry

American Lobster (*Homarus americanus*) is Massachusetts' most valuable single-species fishery (Wilbur and Glenn 2004). Gloucester supports a very active lobster fishery in the waters surrounding Cape Ann - including the shoreline, Outer Harbor, and open coastal waters. In fact, in 2002, the Port of Gloucester landed the most total pounds (1,851,633 pounds) and had the highest number of active lobster fishermen (195 fishermen) of any port in the Commonwealth of Massachusetts (Dean *et al.* 2002).

Due to a City ordinance created in part to help maintain a safe navigation channel, lobstering is not permitted within Gloucester's Inner Harbor. The line for this closed area extends from Cape Pond Ice, located on Fort Point, to a point on Rocky Neck at the northwest corner of the Gloucester Marine Railway.

The Gloucester lobster fishery is influenced by seasonal fluctuations. Studies show that lobster travel inshore during the Spring and back offshore during the late Fall, thus reducing the lobster fishing effort in Gloucester Harbor during December to February (Wilbur and Glenn 2004). Additionally, when the water is colder the lobsters are less active and therefore less likely to enter the traps.

While Gloucester's lobster fishery is influenced by the restricted area and the seasonal migration of lobster, the fishery's own activities, in conjunction with habitat conditions, may also be influencing the legal catch rates. A 1998-1999 survey of lobster in Gloucester Harbor demonstrated the potential impact of harvesting efforts and varied habitat conditions on the lobster population by reporting a higher potential total catch of legal lobsters in the Inner Harbor's restricted area, as compared to the total catch of legal lobsters in the Outer Harbor (Wilbur and Glenn 2004). These findings suggest that, though lobsters can tolerate degraded environmental conditions such as those found in the Inner Harbor, populations are impacted by harvesting practices and changes in environmental conditions.

3-2-6 Other Water-Dependent Operations

In addition to its reputation as a historically significant fishing port, the Port of Gloucester is also the birthplace of frozen packaging of fish and other products. Since this invention in 1925 by Clarence Birdseye in Gloucester, the Port has developed into a major center for frozen seafood products and currently maintains the largest total-capacity of cold storage facilities of any US East Coast port.

Neptune's Harvest, a Division of Ocean Crest Seafoods, Inc. on Harbor Cove, offers a product developed to use what had been waste from the fresh fish that they process. They recover the parts of the fish (head, skeletons, scales, and fins) previously discarded and convert this into organic liquid fertilizer that has gained an international reputation for quality and value as a plant supplement. In addition to providing an environmentally friendly consumer product, Neptune's Harvest benefits the environment by effectively eliminating the need to dispose of the waste commonly generated in processing fish. The Gloucester Marine Terminal is the newest addition to Gloucester's industrial waterfront. Ceremonial groundbreaking for the terminal building occurred in November 2005 and it is expected to be open by the end of 2006. Seabourn and Holland America cruise lines are scheduled to make port calls in the fall of 2006 and the number of ship visits is expected to grow steadily over the next several years. The smaller cruise ships up to the size of the Seabourn Pride (347 feet long with a draft of ~18.5 feet) are able to enter the Inner Harbor and tie up at the Marine Terminal. Larger, deeper draft vessels such as those operated by Holland America anchor in the Outer Harbor and use launches to shuttle their passengers to the terminal. In addition to serving the needs of cruise ship passengers, long-term plans for this facility include ferry service to Nova Scotia, Provincetown, Salem and/or Bar Harbor,, excursion boat operations, a restaurant, and an event space.

Gloucester also offers a variety of vessel services; listed below (Table 3.4).

Table 3.4: Vessel Service Facilities in Gloucester's Inner Harbor (Data from City of Gloucester website, *Guide to Sailors Visiting Gloucester*)

Name	Marina	Boat Yard/ Ship Repair	Marine Electronics Repairs	Marine Engine Repairs	Marine Supplies	Fuel	Rigging Services	Sail Repair	Pump Out
Beacon Marine	X	X			X				
Brown's Yacht Yard	X	X		X	X	X	X		
Enos Marine	X	X		X	X				
Gloucester Marine Railways		X				X			
Harbormaster									X
International Seafood Company	X								
Janro Marine Canvas								X	
Lighthouse Marina	X								
Maritime Heritage Center		X							
N. Shore Sport Fishing Dock	X				X	X			
N.E. Marine and Industrial					X		X		
Rose's Marine		X			X	X			
Seatronics			X						

A large number of charter boat companies also operate out of Gloucester's Inner Harbor. These include companies offering watch watching (4), "head boats" for recreational offshore fishing (12^{+}), and excursion/sight-seeing boats (4^{+}).

3-3 ENVIRONMENTAL CONDITIONS

The information that follows was summarized from a recent report prepared by the Massachusetts Office of Coastal Zone Management (2004):

Typical of any working port, environmental conditions in Gloucester's Inner Harbor have been adversely impacted over time by a number of anthropogenic activities; these impacts include:

1. Contamination of the water column and seafloor from land-based sources (storm water, raw and treated sewage, toxic spills, fish processing, incomplete combustion of fuel, etc.) and vessels (sewage, petroleum and fuel spills).
2. Degraded and lost habitat due to dredging, seafloor scouring from mooring chains and vessel traffic, pollution from vessels and land-based sources, filling of coastal and intertidal habitats, and rising sea levels.
3. Loss of biodiversity due to episodic low concentrations of dissolved oxygen, the introduction of non-indigenous species (via commercial and recreational boating), contaminated sediments and habitat degradation.

Sediment samples within the past five years revealed low levels of heavy metals in Gloucester Harbor, typical of older industrial ports. Copper and lead were prevalent in the Federal Channel. Elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) were measured in the North, South, and Federal Channels and detectable levels of Polychromated biphenyls (PCBs) were found throughout the Federal Channel and in

Harbor Cove. Although much of the sediment in the Annisquam River was clean, some areas were characterized by low levels of metals, PAHs. PCBs, copper, and lead.

3-4 REGULATORY CONDITIONS

Gloucester Harbor is subject to regulatory authorities of local, state, and federal governments. The City regulates land use and the density and dimensions of new development through its Zoning Ordinance. It also regulates wetlands through its General Wetlands Ordinance.

The Commonwealth has regulatory authority over the use and alteration of filled and flowed tidelands under Massachusetts General Law Chapter 91. The purpose of this law and its corresponding waterways regulations (310 CMR 9.00) are to protect the public's rights to use the State's waterways for the purposes of fishing, fowling, and navigation. Chapter 91 applies to structures such as piers, wharves, floats, retaining walls, revetments, pilings, and some waterfront buildings. All existing structures not previously authorized and any new construction or change of use of a structure requires Chapter 91 authorization.

The US Army Corps of Engineers regulates shorefront activities including dredging and filling in or near coastal waters below the High Water Mark (Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act). The Federal Emergency Management Agency (FEMA) is the federal agency responsible for overseeing recovery and relief from natural disasters. FEMA administers the National Flood Insurance Program which produces Flood Insurance Rate Maps (FIRMs). FIRM is the official map of a community on which FEMA has delineated both the special flood hazard areas and the flood risk premium zones applicable to the community.

3-4-1 Zoning

Figure 5-1 illustrates the zoning pattern along the Harbors' waterfront. The harbor planning area includes Marine Industrial, Neighborhood Business, and Central Business zoning districts.

The bulk of the Harbor Plan area falls within the Marine Industrial (MI) District; the only area in the City zoned as MI is the Inner Harbor waterfront. As stated in Section 2.1 of the Zoning Ordinance, the zone was "established only where the district borders coastal and tidal waters, and where the access and utilities roads can support high-intensity, industrial and commercial development that is primarily marine-related." Within the Marine Industrial District, the only allowable uses of the water's edge and of an area at ground level 20 feet back from the water's edge are those that require access to water-borne vessels.

The Central Business District's purpose is to accommodate a combination of retail and business uses, residential uses, office uses, and institutional uses - all of which make up the City's central core. Gorton's headquarters building is located in this district.

The Neighborhood Business District allows a variety of retail business uses consisting primarily of convenience shopping for the surrounding residential areas.

3-4-2 Wetlands

One of the primary responsibilities of the Gloucester Conservation Commission is the administration and enforcement of the Massachusetts Wetlands Protection Act (MGL Ch. 131, sec. 40) along with its corresponding Wetlands Regulations (310 CMR 10.00). In addition, Gloucester has adopted under general Home Rule powers a municipal wetlands by-law (Article II, Sec. 12.10 – 12.21).

Under the Wetlands Act and local by-law, the Conservation Commission has authority over projects in or affecting any categories of resource areas: bank, beach, dune, flat, marsh, swamp, freshwater, or coastal wetlands which border on the ocean or any estuary, creek, river,

stream, pond, or lake. The Commission also has jurisdiction for land under water bodies, land subject to tidal action, land subject to coastal storm flowage, and land subject to flooding. Activities within these resource areas subject to jurisdiction include activities that would remove, fill, dredge, or alter the resource. The Commission also has the right of review for activities within a 100-foot buffer zone around wetlands bordering waterbodies, banks, beaches, and dunes.

3-4-3 Gloucester Waterways Regulations

Gloucester's Waterways Regulations outline the procedures and rules regarding moorings, boat ramps and public landings, traffic, and safety. No one can moor, anchor or set any moored vessel or float within the limits of Gloucester Harbor without obtaining a 10A Mooring Permit from the Harbormaster. Permits are issued on a first come, first serve basis. The Harbormaster has the authority to reassign mooring locations of any permitted vessels at anytime. If there is no room for an applicant's vessel, the person's name will be put on a waiting list that is maintained by the Harbormaster. No mooring is allowed in any navigational channel or where it might interfere with the public's rights of fishing, fowling and navigating on tidelands. Mooring holders may transfer their mooring permits only to a member of their immediate family.

If an assigned mooring is not used for at least 60 consecutive days in a boating season, the location is considered abandoned and may be reassigned unless the permit holder has arranged special conditions with the Harbormaster. The boat owner has a one-year grace period to not have a boat on the mooring, but this year off must be agreed to by the Harbormaster. Transient moorings may be issued by the Harbormaster for use by vessels visiting Gloucester for no more than 14 days. An anchorage is available in the Inner Harbor for use by a vessels as a safe refuge.

The maximum length of any vessel assigned a mooring in Gloucester is 60 feet. It is the responsibility of the permit holder to install and maintain appropriate mooring gear or tackle. Mooring gear should be inspected by the permit holder once a year and lifted out of the water for inspection if necessary.

Mooring fees are established annually by the City Council based on vessel length and permits may be revoked by the Harbormaster if any fee is not paid in full by February 28 of each year.

3-4-4 Chapter 91 and the Waterways Regulations

Massachusetts' principal waterfront regulatory program in tidelands and other waterways is Massachusetts G.L. Chapter 91 (Public Waterways Act, 1866). Chapter 91 and the corresponding Waterways Regulations (310 CMR 9.00) are administered by the Division of Wetlands and Waterways of the Massachusetts Department of Environmental Protection.

Chapter 91 applies in tidelands, great ponds, and along certain rivers and streams. Tidelands refer to all land presently or formerly beneath the waters of the ocean, including lands that are always submerged as well as those in the intertidal area, i.e., below the mean high water mark. This area is governed by a concept in property law known as the public trust doctrine which establishes that all rights in tidelands and the water are held by the state "in trust" for the benefit of the public for the purposes of fishing, fowling, and navigation. The Waterways Act and its corresponding regulations codify the public trust doctrine in Massachusetts.

As clarified by the 1983 amendments to the waterways regulations, Chapter 91 jurisdiction extends landward to the historic high water line and seaward three miles to the limit of state jurisdiction. The historic high water line is the farthest landward tide line which existed "prior to human alteration" by filling, dredging, impoundment or other means (310 CMR 9.02). Thus,

Chapter 91 applies to filled as well as flowed tidelands, so that any filled areas, moving inland to the point of the historic high tide line, are subject to Chapter 91 jurisdiction

Chapter 91 authorization is generally required for any fill, structure, or use not previously authorized in tidelands, including any changes of use and structural alterations. Types of structures include: piers, wharves, floats, retaining walls, revetments, pilings, bridges, dams, and waterfront buildings (if located on filled lands or over the water).

> The benefits that the Chapter 91 program can afford a town are best captured in the five basic objectives of the program:
>
> (1) ensure the waterfront is used primarily for water-dependent purposes;
>
> (2) provide public access;
>
> (3) facilitate other state programs related to shoreline use and conservation;
>
> (4) strengthen local controls and encourage harbor planning; and
>
> (5) ensure accountability to present and future public interests.

For planning purposes, the location of the historic high water line (i.e., upland limits of Chapter 91 jurisdiction) must be established through a review of maps that may reliably show the original natural shoreline or through engineering studies. Previously issued Chapter 91 licenses are also a source of information on the historic high tide line for specific parcels. The Massachusetts Office of Coastal Zone Management is completing a project to map the historic shoreline of the Commonwealth, including Gloucester Harbor. The historic high water lines on these maps may be used by DEP and waterfront property owners as presumptive lines of Chapter 91 jurisdiction. (see Figure 3-9). Ultimately, jurisdiction will be determined by DEP on a property-by-property basis at the time of licensing.

3-4-5 Designated Port Area (301 CMR 25.00)

Much of Gloucester's Inner Harbor has been identified by the state as a Designated Port Area (DPA). The DPA consists of land, piers, and water area from Cape Pond Ice and extending all round the Harbor to the east end of Smith Cove and also includes the Marine Railway on Rocky Neck (see Figure 2-2). The DPA includes a federal channel and anchorage leading to the State Fish Pier and all waters of the Inner Harbor.

The Gloucester DPA, along with the eleven other DPAs in the state, was first identified in the 1978 Massachusetts Coastal Management Plan. This designation complemented CZM program policies that water-dependent industrial uses should be accommodated and encouraged in areas suited for these purposes. Subsequently, these areas were included in the original Waterways Regulations (effective September 15, 1978). A DPA is defined as "an area of contiguous lands and waters in the coastal zone that has been designated in accordance with [the regulations,]" (301 CMR 25.02).

The segment of Gloucester's waterfront described above was designated a DPA because it fulfilled the eligibility requirements of the regulations, in short: navigable channels of 20 foot depth or more at mean low water, tidelands and associated lands abutting such channels that are suited for maritime-dependent industrial uses, availability of appropriate road and/or rail links, and the availability of water and sewer services capable of supporting maritime-dependent industrial uses.

The existence of the DPA on the Gloucester waterfront is significant. Within DPAs, it is the intent of state policy and programs to encourage water-dependent industrial use and to prohibit, on tidelands subject to the jurisdiction of Chapter 91, other uses except for compatible public access and certain industrial, commercial, and transportation activities that can occur on an interim basis if it is found that this would not be a significant detriment to the capacity of DPAs to accommodate water-dependent industrial uses in the future.

DPA designation effects the actions of agencies within the Executive Office of Environmental Affairs (EOEA) in the following ways: (1) in reviewing federal projects (i.e., activities requiring a federal license or permit or receiving federal funds) under its federal consistency responsibilities, CZM seeks to ensure proposed activities in or affecting a DPA are consistent with the DPA regulations (301 CMR 25.00) and the relevant policies of the CZM program; and (2) all EOEA agencies are obliged to enforce laws, process regulatory reviews (i.e., Chapter 91), conduct program activities, disburse funds, and administer their programs so as to advance the purpose of the DPA regulations.

Water-dependent industrial uses are described in the Waterways Regulations (310 CMR 9.12(2)(b)). In general, water-dependent industrial uses are those industrial and infrastructure facilities that are dependent on marine transportation or require large volumes of water to be withdrawn from or discharged to a waterway for cooling, processing, or treatment purposes. The following water-dependent industrial uses are listed in the Waterways Regulations:

- Marine terminals and related facilities for the transfer between ship and shore, and the storage of bulk materials or other goods transported in waterborne commerce.
- Facilities associated with commercial passenger vessel operations.
- Manufacturing facilities relying primarily on the bulk receipt or shipment of goods by waterborne transportation.
- Commercial fishing and fish processing facilities.
- Boatyards, dry docks, and other facilities related to the construction, servicing, maintenance, repair, or storage of vessels other than marine structures.
- Facilities for tug boats, barges, dredges, or other vessels engaged in port operations or marine construction.
- Any water-dependent use listed in 310 CMR 9.12(2)(a)(9-14) provided DEP determines such use to be associated with the operation of a DPA.
- Hydroelectric power generating facilities.
- Other industrial uses or infrastructure facilities that cannot be reasonable located on an inland site.

Until 1984, the DPA provisions only applied in the waterway itself. In that year, the legislature amended the statute to expand licensing authority of DEP to include filled tidelands. In Designated Port Areas, all historically-filled tidelands are within the regulatory jurisdiction of Chapter 91 even if separated by a public way and more than 250 feet from any flowed tidelands. In 1990, the Waterways Regulations underwent major revisions that included a prohibition on most non-industrial uses in DPAs and limited the extent to which nonwater-dependent industrial activities were allowed to occur. Most recently, in 1994, EOEA revised MCZM regulations and the Waterways Regulations related to DPAs. Among the changes, a new section of EOEA regulations (301 CMR 25.00), Designated Port Areas, was created, setting forth the procedure for establishing and modifying the boundaries of DPAs.

These latest regulatory amendments included important changes to enhance the flexibility and economic viability of DPAs. The most significant change was to make most nonwater-dependent industrial uses and commercial uses eligible for licensing as "Supporting DPA Uses" if they provide direct economic or operational support to the water-dependent industrial use in the DPA. Nonwater-dependent industrial uses and commercial uses (both water-dependent and nonwater-dependent) that qualify as Supporting Uses may occupy an area of DPA property equal to 25 percent of all filled tidelands and piers on the project site. Larger amounts of the site may be developed for supporting use if authorized by an approved DPA Master Plan.

Another provision of the amended regulations that provides flexibility is the licensing of a project site(s) as a Marine Industrial Park. This mechanism is appropriate for those sites where it would be economically beneficial to augment the predominant water-dependent industrial use with general industrial uses. Under this licensing arrangement, the area devoted to maritime activity (water-dependent industrial) must include all pile-supported pier space and be of a size equal to at least two-thirds of all filled tidelands and piers on the project site; the remainder can be used for general (nonwater-dependent) industrial purposes and incidental commercial uses. These latter uses may include restaurant or office and retail space (but not residential or hotel) that is supportive of and incidental to the water-dependent industrial uses.

The licensing of certain nonwater-dependent industrial uses as a Temporary Use is another means to increase economic utilization of DPA lands. Warehousing, trucking, parking, and other similar uses on otherwise vacant land can be licensed for up to ten years.

The DPA Master Plan provides some flexibility in calculating the amount of Supporting Uses that may be allowed and in siting these uses within the DPA. Through the Master Plan, the area that can be devoted to Supporting Commercial Uses can equal 25 percent of the entire land area of the DPA. If recommended in an approved Master Plan, Supporting Industrial Uses may occupy an even greater area (though other siting requirements of the regulations would impose a practical limitation). Further, the Plan may specify where in the DPA these uses could or should be sited or concentrated. The setbacks required for nonwater-dependent industrial and commercial uses cannot be modified by the DPA Master Plan.

The provisions of a municipal harbor plan can be effective in providing guidance for DEP in applying the numerous discretionary requirements of the Waterways Regulations. One form of guidance could be to restrict the list of uses allowed by DEP on tidelands or in the DPA to those the community wishes to promote. For example, in the DPA, the Master Plan could present a list of eligible Supporting Uses to guide DEP in future licensing.

3-4-6 Special Acts of the Legislature

Prior to 1866 when Chapter 91 was first promulgated, the Massachusetts legislature issued Special Acts to transfer title of a property from the Commonwealth to a waterfront landowner and to enable particular types of development to take place on the property as specified in the Act. The rights granted within a Special Act are transferred to each successor at the time of sale, but they do not exempt a property owner from Chapter 91 review for a new or modified use of the property.

3-4-7 Federal Emergency Management Act Regulations

The FEMA Flood Zones Map provides a plan for the various Flood Insurance Zones along the shoreline as established by the Flood Insurance Study of the City of Gloucester.

The majority of the planning area, including all properties along the water's edge beyond the mouth of the Harbor, is subject to the 100-year flood, meaning that the annual probability of flooding in the area is one percent.

The area around the Fort, with the exception of the land right on the edge of the water, is classified as X. This classification describes areas outside of the 500-year flood plain. Properties in this area have less than a 0.2% chance of flooding each year.

The land most vulnerable to flooding is located at the mouth of the Harbor, and is classified as a velocity zone (VE). This classification suggests that properties in this area not only have a one percent chance of annual flooding, but that they are also subject to additional hazards associated with storm waves.

FEMA periodically updates flood hazard maps by conducting a detailed reevaluation of flood hazards, referred to as a flood study. However, flood studies are time consuming and expensive, so far fewer than needed are done. As an alternative, FEMA has established procedures by which a community may compile appropriate data and request a map revision. Further, if an individual homeowner has technical information to indicate that his or her home has been inadvertently shown within the Special Flood Hazard Area on a Flood Insurance Rate Map, the homeowner may submit that information to FEMA and request that FEMA remove the flood zone designation from the home by issuing a Letter of Map Amendment (LOMA) or a Letter of Map Revision Based on Fill (LOMR-F). Requests for LOMAs/LOMR-F must include the surveyed elevation of the lowest grade adjacent to the structure or the lowest enclosed level of the structure along with certain other information.

3-4-8 US Army Corps of Engineers Regulations

Section 404 of the Clean Water Act authorizes the Corps to regulate the discharge of dredged or fill material into "waters of the United States" which are all navigable waters, tributaries to navigable waters, wetlands adjacent to those waters. The limit of jurisdiction is the high tide line in tidal waters; where adjacent wetlands are present, it is the limit of the wetland. Regulated activities include the placement of fill for construction, site-development fill, riprap, seawalls, and beach nourishment.

Section 10 of the Rivers and Harbors Act of 1989 authorizes the US Army Corps of Engineers to regulate structures and work in navigable waters of the US. Jurisdiction extends shoreward to the mean high water line. Regulated activities include construction of piers and wharves, permanent mooring structures such as pilings, intake and outfall pipes, boat ramps, and dredging and disposal of dredged material, excavation, and filling.

The Corps' other major responsibility is to plan and carry out water resources projects such as improvements to navigation. Since 1986, the cost for such projects is shared between the federal government and the nonfederal sponsors. An important consideration in the Corps' decision to undertake a project is that its benefits exceed the cost. For projects such as dredging of harbors and navigation channels, highest priority goes to projects that benefit maritime industry such as shipping and fishing.

The channel into Gloucester Harbor is a federally created and maintained navigation channel.

3-4-9 Phase II NPDES Storm Water Program

The US EPA's storm water management program, initiated in 1990 under the Clean Water Act, is aimed at preserving, protecting and improving the Nation's water resources from polluted storm water runoff. The first phase of the program focused on using the National Pollutant Discharge Elimination System (NPDES) permits to address storm water runoff from larger storm sewer systems serving populations of 100,000 or more and construction activities disturbing five acres or more and certain industrial activities. Phase II, which began in 1999, extended the NPDES permit coverage for storm water discharges from smaller storm sewer systems (under

100,000 population) in urbanized areas and smaller construction sites (activities disturbing between one and five acres of land).

Phase II is an attempt to further reduce adverse impacts to water quality and aquatic habitat through the use of controls such as public educational programs, storm sewer inspections for illegal connections, and ordinances to control construction site runoff.

3-4-10 Massachusetts Ocean Sanctuary Program

In 1970, Massachusetts passed the Ocean Sanctuaries Act (Ch. 132A, Section 12A) which applies to the area between the mean low water line and three miles offshore, except for the area between Lynn and Marshfield. The Ocean Sanctuaries Act is designed to protect coastal waters by prohibiting activities that could be environmentally or aesthetically damaging. The Act prohibits exploitation or development that would seriously alter or endanger the ecology or appearance of the ocean, seabed or the subsoil. Some of these prohibited activities include building on the seabed, drilling, dumping wastes, and commercial advertising. However, fishing, sand extraction, and special projects are still allowed under the act. The Department of Environmental Management (DEM) has jurisdiction over the ocean sanctuaries and DEM must approve all activities that occur on, or in, these areas.